DrawTogether!
A Paxos-based Collaborative Drawing Game

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1 What is DrawTogether!

DrawTogether! is an online collaborative drawing game. Multiple players can accomplish a picture together. A player can see others' changes in real time. Just enjoy it! :)

2 What can DrawTogether! do

Players can use the pencil to draw on the canvas. You can also select any color you like. If you are not satisfied with current picture, just click the eraser button and clear the canvas. You can see other players update in real time and they can see yours too!
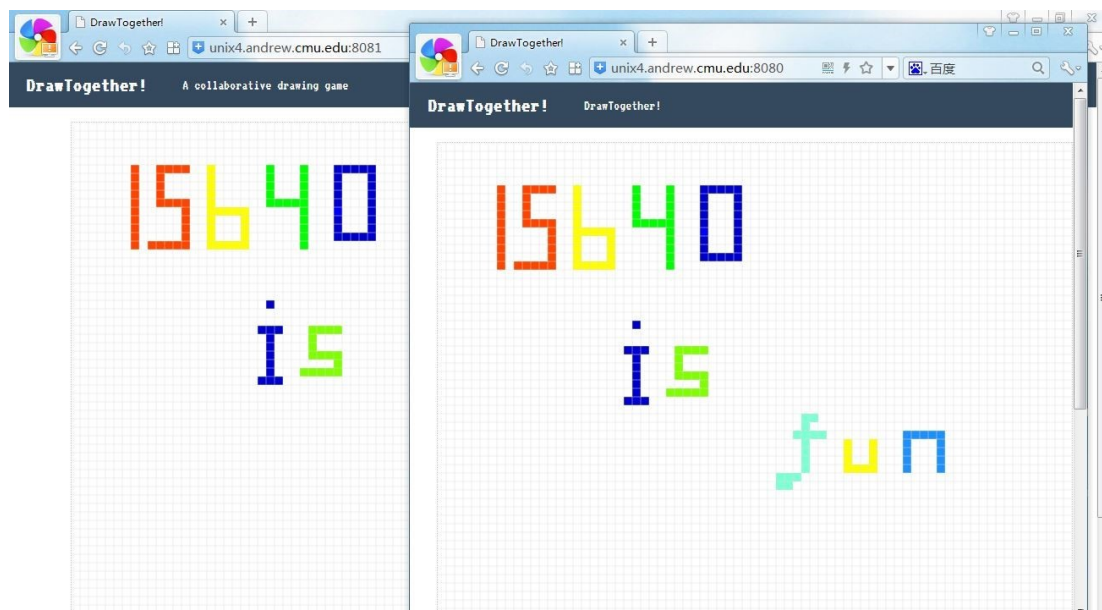

Figure 1: Two players can accomplish the picture collaboratively

Figure 2: Play can change color and clear the canvas.

3 How to run DrawTogether!

First, untar the paxosapp.tar using command

```
tar -xvf paxosapp.tar
```

Second, use the following command to enter the app directory:

```
cd paxosapp/app
```

Note: Please make sure there is no directory called p3 in the HOME directory.
Next, run the script using the following command:

```
./run.sh
```

Wait for the server to start...
When the server is running, you can visit page: http://localhost:8080 and http://localhost:8081
to play the game. Here we assume that there are two servers running on different locations using different paxos nodes. Users will choose the nearest one to visit. Although they connect to different servers, they can still draw a picture together because nodes have to follow Paxos to maintain the consistency.

4 Structure of the application

Our application has three components: front-end, server, and paxos nodes. Front-end is responsible for handling events (e.g. drawing a line). Servers are responsible for handling users' requests. Paxos nodes are responsible for storing a specific key-value pair.
The structure of our implementation is as follows:

```
.
|-- app
|   |-- drawtogether.go
|   |-- index.html
|   |-- js
|   |   |-- pixelpals.js
|   |-- run.sh
|-- paxos
    |-- paxos_api.go
    |-- paxos_impl.go
```

`pixelpals.js` uses AJAX to catch the users' movement and handle the events. `drawtogether.go` is our server which responsible for handling users' requests. And our Paxos logis is implemented in `paxos_impl.go`.
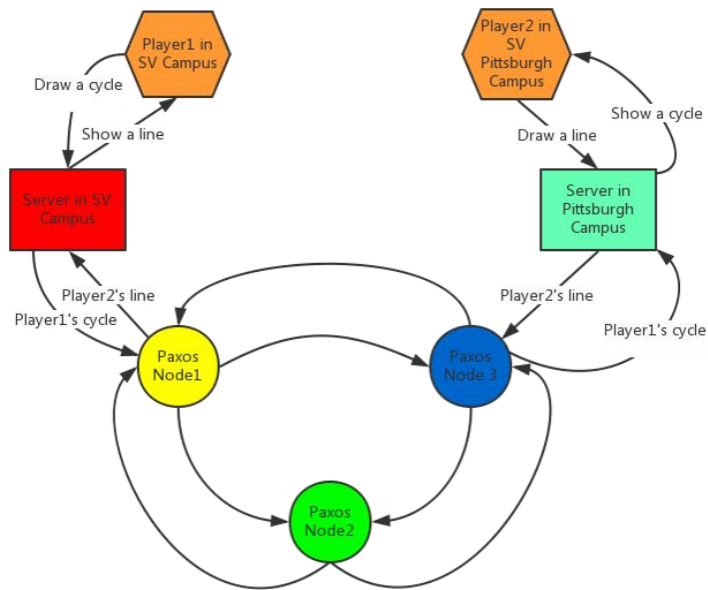
The structure of the application is as follows:

Figure 3: The structure of the application.